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Powdery Mildew of Landscape Ornamentals

Powdery mildew can diminish the beauty of landscape ornamentals; however, it can be controlled through cultural practices or chemical alternatives.

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Powdery mildew is the name for the grayish white powdery coating of fungus mycelium and masses of spores growing on plant leaves, shoots and flowers. This disease is caused by a distinct group of similar fungi that attacks a wide variety of plants. Lilac, zinnia and many other flowers and shrubs can be damaged. Although plants infected with powdery mildew rarely die, the disease detracts from the natural beauty of ornamentals. Damage ranges from an unsightly white powdery coating on the foliage to malformation of leaves, destruction of flowers and stunted plant growth.

Most species of powdery mildew fungi have a narrow host range and can attack only closely related plants, while others are less host specific and occur on many host genera. As a group these fungi cause similar symptoms such as powdery growth on a large number of herbaceous and woody annuals and perennials in the landscape (*Table I*). There are eight genera of fungi that cause powdery mildew; however because of host specificity, infection of one ornamental species does not necessarily mean that a neighboring ornamental also will be infected.

Table I. A list of herbaceous and woody plants commonly used in landscapes which are susceptible to powdery mildew.

• Azalea • Calendula • Chinese Photinia • Chrysanthemum • Cineraria • Cosmos • Cotoneaster • Dahlia • Delphinium	• Euonymus • Honeysuckle • Kalanchoe • Lilac • Phlox • Privet • Pyracantha (Firethorn) • Rhododendron • Rieger Begonia	• Rose • Shasta Daisy • Smoke-tree • Snapdragon • Snowball Hydrangea • Snowball Viburnum • Spirea • Wisteria • Zinnia

Key Signs and Symptoms

- White- to grayish-white or buff-colored patches or coatings on leaves, shoots and buds.
- Mildew patches or coatings that consist of a cottony, thread-like mat of fungus mycelium and chains of spores, mostly on the upper leaf surface.
- Later in the season the mildew coating is dotted with small dark brown to black pepper-seed-sized specks.
- Infected leaves may yellow, curl and drop prematurely.
- Tender, young foliage and shoots are most susceptible.

Conditions Favoring Infection

Growing conditions such as excessive nitrogen fertilization and overwatering, and humid, overcast weather when days are warm and nights are cool favor powdery mildew development. In the landscape the disease is common in crowded plantings and in damp, shaded areas with restricted air movement. It is most severe in late spring and early fall but will occur anytime during the growing season. In greenhouses powdery mildew is a year-round problem.

Control

The high nutrient and energy demands that powdery mildew fungi have for their growth and reproduction are met at the expense of the host plant. Although control is not too difficult, it is necessary if susceptible plants are used in the landscape.

Planting varieties resistant to powdery mildew is the easiest, least expensive and preferred method of disease management. Unfortunately, seed catalog and seed packet variety descriptions are often ambiguous and don't identify resistance to specific diseases. Most descriptions merely state that this variety is "disease resistant or disease tolerant" which, essentially, tells you nothing. Varieties of various landscape flowers and shrubs differ in their mildew susceptibility, so ask about disease resistance to powdery mildew when buying ornamentals. For example variegated euonymus varieties usually are more resistant to powdery mildew than green, nonvariegated types, and Pulcino and African zinnias show better mildew tolerance than other outdoor zinnias.

Rose **Zinnia** **Lilac** **Honeysuckle Vine**

Figure 1. Powdery mildew symptoms and signs on various landscape ornamentals (clockwise from left): rose, zinnia, honeysuckle vine, and lilac.

Since powdery mildews are most severe on roses, phlox, zinnias and lilacs, locate these plantings in open, sunlit, well drained sites. Allowing adequate spacing of plants in flower beds and in the landscape, and choosing the right plant for the right location are examples of cultural practices that make conditions less favorable for the disease. Other cultural practices that reduce the threat of powdery mildew are pruning established shrubs to improve air circulation and sunlight penetration around and to the foliage and maintaining a slow, even growth rate with light frequent nitrogen fertilization. Since the powdery mildew fungi are superficial on the leaf surface, gently spraying plants daily with a stream of water washes off some of the mycelial mat and spores and may reduce the amount of powdery mildew. At the end of the growing season, destroy or discard powdery mildew-infected annuals and leaves of shrubs to reduce carryover of the

mildew fungi into the next season.

Due to their external nature, powdery mildew fungi are easily controlled by properly timed and applied fungicide applications (*Table II*). These can prevent new infections and eradicate established ones on powdery mildew sensitive plantings. On plants highly sensitive to mildew, begin fungicide applications shortly before budbreak in spring and follow with a two-week spray schedule until early summer. On less susceptible plants, a fungicide can be applied at the first signs of mildew on the foliage with repeat applications as needed based on weather conditions. When selecting a fungicide don't confuse powdery mildew with a disease called downy mildew. They are two completely different diseases and the fungicides that control one probably will not control the other.

For the organic gardener, sulfur products offer an alternative to traditional fungicides. Be careful when using sulfur, since it can injure plants if applied at temperatures above 90°F. Also, it is generally less effective than the other products for controlling powdery mildew. When using a fungicide, always read and follow label directions. By doing this you present less risk to yourself, the plant and the environment.

Table II. A partial listing of home garden and landscape fungicides for powdery mildew control on ornamentals.

Common name	**Product names[1]**
Chlorothalonil	Ortho Multipurpose Fungicide Daconil 2787 Bonide Liquid Fungicide Dragon Daconil 2787 Acme Multi-Purpose Fungicide Ferti-lome Broad Spectrum Liquid Fungicide
Chlorothalonil + Sulfur	GreenLight Rose & Flower Dust
Copper	Dragon Copper Fungicide Ferti-lome Rose Spray
Sulfur	Bonide Sulfur Plant Fungicide Ortho Garden Sulfur
Triadimefon	Bonide Bayleton Systemic Fungicide GreenLight Fung-Away Systemic Fungicide
Triforine	Ortho Funginex Orthenex Rose & Flower Spray

[1] Hosts and diseases listed on specific product labels may differ between products containing the same active ingredient.

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